

Avian Species Attracted to and Utilizing
the Minor E. Clark Fish Hatchery

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ABSTRACT

A study was conducted at Minor E. Clark Fish Hatchery, Rowan County, Kentucky to investigate the avian species attracted to and utilizing the habitat created by the hatchery. The study was conducted from September, 1982 to December, 1983. A total of 162 species were recorded. The habitat created by the construction of Clark Hatchery has increased the occurrence of waterfowl and shorebird species in this area of Kentucky.

INTRODUCTION

"Eastern Kentucky has been ignored to a considerable degree and knowledge regarding its fauna is limited" (Barbour, 1951). Pierre Allaire found this statement applicable in 1974 (Allaire, 1974). This comment is still true in 1984. Anne L. Stamm, past president of the Kentucky Ornithological Society has said, "We need additional information from Eastern Kentucky, especially the Cave Run area" (Stamm, 1981, pers. commun.). "Some of the most interesting and most needed reports come from Eastern Kentucky", is a statement by the former editor of the Kentucky Warbler (Shadowen, 1982). Mengel's publication (Mengel, 1965), Monroe's summary (Monroe, 1969) and Barbour's, et. al., finding guide (1972) contain helpful information about Kentucky's avifauna, but a number of major environmental changes have occurred in Eastern Kentucky since 1950. The impoundment of large lakes, surface mine reclamation (Allaire, 1974, 1978, 1981), different agriculture and forestry techniques (McComb and Moriarty, 1981) have altered Eastern Kentucky's avian habitats and populations. Minor E. Clark Fish Hatchery is located in Eastern Kentucky.

Transient lakes, similar in some aspects to the ponds at Clark Hatchery, have long been recognized as unique birding areas (Wilson, 1951, 1968; Shadowen, 1972) by serving as temporary stopping points for migrating birds.

The purpose of this study was to observe and report on avian species attracted to and utilizing the habitat created by the Minor E. Clark Fish Hatchery.

ACKNOWLEDGEMENTS

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STUDY AREA

Minor E. Clark Fish Hatchery is located 8 miles (12.8 km) southwest of Morehead, Rowan County, Kentucky. Rowan County and the study area are on the western edge of the Cumberland Plateau. The hatchery is in the Cumberland Upland avifaunal region of Kentucky (Mengel, 1965), which comprises most of the Cumberland Plateau. The Cumberland Upland avifaunal region is marked by the richest forest avifauna in Kentucky, both in numbers of species and numbers of common species (Mengel, 1965). The study area is sufficiently close enough to the Limestone Plateau avifaunal region for the study area to be ecotonal in the nature of its avifauna.

Clark Hatchery is one of the largest state-owned warm-water hatcheries in the United States. Construction was completed in 1972. The average elevation of the study area is approximately 680 feet (207 m) mean sea level. The hatchery covers 300

acres(121.4 ha) and contains 111 rearing and brood ponds. The hatchery has 122.5 acres(49.6 ha) of water that includes eighty-two 1.0 acre(0.4 ha) ponds, twenty-five 0.1 acre(0.04 ha) ponds with the remaining 38 acres(15.37 ha) of water in four large brood ponds, one of which is an oxbow lake. The remaining 189 acres(76.5 ha) consists of roadways, mixed forest stands, planted fields(corn), grassy-marsh areas and an office-residential area. Clark Hatchery is located 275 yards(250 m) west of Cave Run Lake and is bounded on the southern and western sides by the Licking River.

The hatchery is a restricted area, a state designated wildlife sanctuary. This, along with the habitat created by the ponds, marsh areas, fields, and the close proximity to Cave Run Lake and the Licking River serve as a special attraction to birds.

METHODS

Methods employed in this study were modified from the methods of Emlen(1971,1977) using transect routes to identify birds from visual and audible cues. The transect route width varied with the season(Robbins,1972) and the habitat(Reynolds, et.al.1980). The transect route (Fig.1) was chosen to achieve maximum coverage of the different habitats of the study area.

The survey route was covered in a motor vehicle with periodic stops made to observe and record the species and the number of birds seen. On eighteen visits it was necessary to cover interior of the oxbow lake on foot because weather

conditions prevented coverage in a motor vehicle.

The study area was visited a total of 66 times from 8 September 1982 to 2 December 1983. Sixty one surveys were made between 7:00 A.M. and Noon and five surveys were between 2:00 P.M. and 5:00 P.M. Visual observations were made using binoculars (8.5 x 44) and a spotting scope (15x - 60x).

The species and the number of birds observed, visually or audibly, on each trip were recorded on a transect route map.

RESULTS AND DISCUSSION

A total of 162 species were encountered during the study. The maximum number of species observed on a single survey was 66 species on 17 May 1983 and the greatest number of individuals was 1376 observed on 19 October 1983. The data from the study are presented in Table 1. Table 1 shows by species the season(s) of the sightings, the total number of sightings, the total number of individuals sighted and the average number of individuals per sighting. Species are named and listed in accordance with their order in the new A.O.U. Check-list of North American Birds (A.O.U., 1983).

A total of 35 species are known to nest within the hatchery. Nests were located for the nesting species. An additional 17 species are suspected as nesting within or at least nearby the study area. Adults carrying food or juvenile birds were observed for the suspected breeding species. Data for breeding species are presented in Table 2.

The Kentucky Ornithological Society lists 17 orders of birds on its Check-List of Kentucky Birds. I observed 16 of these orders at Clark Hatchery. The only order not observed was the order Pelecaniformes. A representative of this order, the Double-crested Cormorant, has been observed several times on Cave Run Lake.

Fourteen species were observed that Mengel lists as unrecorded on the Cumberland Plateau (Mengel, 1965). The unrecorded species are: Horned Grebe, Wood Stork, Green-winged Teal, Gadwall, Canvasback, Redhead, Oldsquaw, Common Goldeneye, Bufflehead, Red-breasted Merganser, Black-bellied Plover, Ruddy Turnstone, Wilson's Phalarope and Least Tern. All of the preceeding species are waterfowl or shorebirds that use the hatchery as a stop during migration. Mengel (1965) indicates very few Cumberland Plateau records for the following species. They are: Semipalmated Plover, White-rumped Sandpiper, Dunlin, Semipalmated Sandpiper, Tree Swallow and Marsh Wren. All of these species were observed during the study period. A Northern Pintail was observed at the hatchery prior to study period and two additional species, American Wigeon and Brewer's Blackbird, have been recorded since the study was concluded in December, 1983.

A comparison of my records against the occurrence records for Kentucky developed by Monroe (1969) indicated that my observations were within the dates he had recorded.

The species observed at Clark Hatchery are similar to

those recorded at the transient lakes located near Bowling Green (Wilson, 1951, 1968; Shadowen, 1972). Clark Hatchery may soon serve as an attraction equal to the transient lakes.

Current management practices of draining the ponds in the fall serve as an excellent attraction for shorebirds. The oxbow and small ponds that remain filled throughout the year attract waterfowl. During the winter months the Bald Eagle is often seen on snags over the Licking River that forms the southern boundary of the hatchery. This area of the river, tailwaters of Cave Run Lake, remains ice free during severe weather when Cave Run Lake often freezes. The planted fields and tree stands provide an excellent source of food and shelter for the passerines.

The initial conclusion that can be formed is that since construction of Clark Hatchery and Cave Run Lake the occurrence of waterfowl and shorebirds in this area of Kentucky has increased in both the number of species and the number of individual birds. The hatchery serves as a special attraction for migrating birds.

The results of this study should serve as a starting point for continued observation and documentation of the changing avian populations of the Cave Run area and Eastern Kentucky. It will be necessary to continue the study for several years to fully document the transitional period.

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TABLE 1.- Avian species sighted at M.E.Clark Hatchery. Species are presented by the season sighted, total number of sightings, total number of individuals and average individuals per sighting.

Species	Season Observed	Total No. Sightings	Total No. Individuals	Average Per Sighting
Gaviiformes				
Common Loon.....	F	4	4	1.0
Podicipediformes				
Pied-billed Grebe.....	Sp,F	33	100	3.0
Horned Grebe.....	F	1	1	1.0
Ciconiiformes				
American Bittern.....	F	3	3	1.0
Great Blue Heron.....	Y	59	339	5.7
Great Egret.....	Sp	1	1	1.0
Little Blue Heron.....	F	7	15	2.1
Cattle Egret.....	Sp,F	5	6	1.2
Green-Backed Heron.....	Su	28	553	19.8
Black-crowned Night Heron.	F	7	9	1.3
Wood Stork.....	Sp	1	1	1.0
Anseriformes				
Canada Goose.....	Sp,F,W	8	45	5.6
Wood Duck.....	Sp,Su,F	31	153	4.9
Green-winged Teal.....	F	3	3	3.0
Black Duck.....	Sp,F,W	5	16	3.2
Mallard.....	Y	42	194	4.6
Blue-winged Teal.....	Sp,F	25	241	9.6
Northern Shoveler.....	Sp,F	5	17	3.4
Gadwall.....	W	1	3	3.0
Canvasback.....	Sp	3	6	2.0
Redhead.....	F	1	1	1.0
Ring-necked Duck.....	Sp,F	16	61	3.8
Greater Scaup.....	Sp	1	4	4.0
Lesser Scaup.....	Sp,F,W	18	21	1.2
Oldsquaw.....	W	10	14	1.4
Common Goldeneye.....	Sp	2	6	3.0
Bufflehead.....	Sp,F,W	23	131	5.7
Hooded Merganser.....	Sp,F,W	23	203	8.8
Common Merganser.....	Sp	1	1	1.0
Red-breasted Merganser....	Sp	2	4	2.0
Ruddy Duck.....	Sp,F	2	3	1.5
Falconiformes				
Black Vulture.....	Sp,F	6	47	7.8
Turkey Vulture.....	Y	39	517	13.2
Osprey.....	Sp,Su,F	29	30	1.0
Bald Eagle.....	Sp,F,W	7	11	1.5
Northern Harrier.....	W	3	3	1.0
Cooper's Hawk.....	Y	10	12	1.2
Red-shouldered Hawk.....	Y	12	12	1.0
Broad-winged Hawk.....	Su	1	1	1.0
Red-tailed Hawk.....	Y	29	33	1.1
American Kestrel.....	Y	25	31	1.2
Galliformes				
Northern Bobwhite.....	Y	25	92	3.7
Gruiformes				
American Coot.....	Sp,F,W	22	187	8.5
Charadriiformes				
Black-bellied Plover.....	F	1	2	2.0
Lesser Golden Plover.....	F	4	4	1.0
Semipalmated Plover.....	F	7	24	3.4
Killdeer.....	Y	63	2094	33.2
Greater Yellowlegs.....	Sp,F	9	29	3.2
Lesser Yellowlegs.....	Sp,F	18	88	4.9
Solitary Sandpiper.....	Sp	3	7	2.3
Spotted Sandpiper.....	Sp,F	21	77	3.7
Ruddy Turnstone.....	F	1	1	1.0
Semipalmated Sandpiper....	F	17	247	14.5
Western Sandpiper.....	F	2	11	5.5
Least Sandpiper.....	F	31	239	7.7
White-rumped Sandpiper....	F	1	2	2.0
Pectoral Sandpiper.....	F	28	213	7.6
Dunlin.....	F	15	106	7.1
Stilt Sandpiper.....	F	3	7	2.3
Common Snipe.....	F	3	13	4.3
American Woodcock.....	F	1	1	1.0
Wilson's Phalarope.....	F	1	1	1.0
Bonaparte's Gull.....	Sp,F	3	6	2.0
Ring-billed Gull.....	Sp,F	20	145	7.3
Herring Gull.....	Sp	1	3	3.0
Common Tern.....	F	4	4	1.0
Forster's Tern.....	F	1	1	1.0
Least Tern.....	F	2	7	3.5
Columbiformes				
Rock Dove.....	Y	6	20	3.3
Mourning Dove.....	Y	59	522	8.8

TABLE 1.- Continued.

Species	Season Observed	Total No. Sightings	Total No. Individuals	Average Per Sighting
Cuculiformes				
Black-billed Cuckoo.....	Su	2	2	1.0
Yellow-billed Cuckoo.....	Su	7	9	1.3
Strigiformes				
Eastern Screech-Owl.....	Y	2	2	1.0
Barred Owl.....	Y	1	1	1.0
Apodiformes				
Chimney Swift.....	Su	24	745	31.0
Ruby-throated Hummingbird.	Su	10	16	1.6
Coraciiformes				
Belted Kingfisher.....	Y	62	217	3.5
Piciformes				
Red-bellied Woodpecker....	Sp,F,W	22	32	1.5
Downy Woodpecker.....	Y	42	94	2.2
Hairy Woodpecker.....	Y	3	3	1.0
Northern Flicker.....	Y	62	190	3.1
Piliated Woodpecker.....	Y	34	43	1.3
Passeriformes				
Tyrannidae				
Eastern Wood-Pewee.....	Su	5	6	1.2
Willow Flycatcher.....	Sp	6	13	2.2
Least Flycatcher.....	F	1	4	4.0
Eastern Phoebe.....	Y	36	84	2.3
Eastern Kingbird.....	Sp,Su,F	19	58	3.1
Hirundinidae				
Purple Martin.....	Sp,Su,F	5	20	4.0
Tree Swallow.....	Sp,F	17	830	48.8
Northern Rough-wg. Swallow.	Sp,Su,F	18	156	8.7
Bank Swallow.....	Sp	3	325	108.0
Cliff Swallow.....	F	1	6	6.0
Barn Swallow.....	Sp,Su,F	30	501	16.7
Corvidae				
Blue Jay.....	Y	66	530	8.0
American Crow.....	Y	66	1014	15.4
Paridae				
Carolina Chickadee.....	Y	54	322	6.0
Tufted Titmouse.....	Y	39	218	5.6
Sittidae				
Red-breasted Nuthatch....	W	1	1	1.0
White-breasted Nuthatch...	Y	28	45	1.6
Certhiidae				
Brown Creeper.....	W	2	2	1.0
Troglodytidae				
Carolina Wren.....	Y	34	91	2.7
Winter Wren.....	W	2	2	1.0
Marsh Wren.....	F	2	6	3.0
Muscicapidae				
Sylviinae				
Golden-crowned Kinglet....	W	1	3	3.0
Ruby-crowned Kinglet.....	W	3	10	3.3
Blue-gray Gnatcatcher.....	Sp,Su	6	16	2.7
Turdinae				
Eastern Bluebird.....	Y	45	140	3.1
American Robin.....	Y	56	859	15.3
Mimidae				
Gray Catbird.....	Sp,Su,F	25	78	3.1
Northern Mockingbird.....	Y	3	4	1.3
Brown Thrasher.....	Su	21	68	3.2
Motacillidae				
Water Pipit.....	F	4	22	5.5
Bombycillidae				
Cedar Waxwing.....	Sp,F,W	26	443	17.0
Sturnidae				
European Starling.....	Y	64	283	4.4
Vireonidae				
White-eyed Vireo.....	Su	18	56	3.1
Yellow-throated Vireo.....	Sp	1	1	1.0
Philadelphia Vireo.....	F	1	2	2.0
Red-eyed Vireo.....	Sp,Su	20	92	4.6
Emberizidae				
Parulinae				
Blue-winged Warbler.....	Sp,Su,F	7	9	1.3
Yellow Warbler.....	Sp,Su,F	13	72	5.5
Chestnut-sided Warbler....	Sp,F	2	20	10.0
Magnolia Warbler.....	F	3	22	7.3
Yellow-rumped Warbler.....	Sp,F	22	530	24.0
Black-th. Green Warbler..	F	3	13	4.3
Yellow-throated Warbler...	Sp	1	1	1.0
Pine Warbler.....	Sp,F	6	39	6.5

TABLE 1.- Continued.

Species	Season Observed	Total No. Sightings	Total No. Individuals	Average Per Sighting
Prairie Warbler.....	F	2	6	3.0
Palm Warbler.....	F	2	5	2.5
Bay-breasted Warbler.....	Sp, F	7	109	15.6
Blackpoll Warbler.....	Sp	1	6	6.0
Black & White Warbler.....	Sp, F	2	8	4.0
American Redstart.....	Sp, Su, F	3	9	3.0
Louisiana Waterthrush.....	Sp	5	8	1.6
Kentucky Warbler.....	Sp	1	1	1.0
Mourning Warbler.....	F	1	2	2.0
Common Yellowthroat.....	Sp, Su, F	21	233	11.1
Yellow-breasted Chat.....	Sp, Su, F	8	20	2.5
Cardinalinae				
Northern Cardinal.....	Y	64	469	7.3
Rose-breasted Grosbeak....	F	4	25	6.3
Indigo Bunting.....	Sp, Su, F	27	195	7.2
Emberizinae				
Rufous-sided Towhee.....	Y	42	90	2.1
American Tree Sparrow.....	W	1	3	3.0
Chipping Sparrow.....	Sp, Su, F	9	33	3.7
Field Sparrow.....	Y	30	519	17.3
Vesper Sparrow.....	Sp	1	2	2.0
Savannah Sparrow.....	Sp, F	6	26	4.3
Fox Sparrow.....	W	15	56	3.7
Song Sparrow.....	Y	65	1513	23.3
Swamp Sparrow.....	W	30	386	12.9
White-throated Sparrow....	W	39	996	25.5
White-crowned Sparrow.....	Sp, W	5	20	4.0
Dark-eyed Junco.....	Sp, F, W	32	1444	45.1
Icterinae				
Red-winged Blackbird.....	Sp, Su, F	46	2407	52.3
Eastern Meadowlark.....	Y	53	318	6.0
Rusty Blackbird.....	F	4	234	58.5
Common Grackle.....	Sp, Su, F	49	4525	92.3
Brown-headed Cowbird.....	Sp, Su	12	88	7.3
Orchard Oriole.....	Su	3	4	1.3
Northern Oriole.....	Su	1	1	1.0
Fringillidae.....				
American Goldfinch.....	Y	51	639	12.5
Evening Grosbeak.....	F	2	65	32.5
Passerinae				
House Sparrow.....	Y	58	556	9.6

TABLE 2.- Known and suspected breeding species of M. E. Clark Hatchery.

Species	Breeding Status	
	Known	Suspected
Ciconiiformes		
Green-backed Heron.....		x
Anseriformes		
Wood Duck.....	x	
Mallard.....	x	
Falconiformes		
Cooper's Hawk.....		x
American Kestrel.....		x
Galliformes		
Northern Bobwhite.....	x	
Charadriiformes		
Killdeer.....	x	
Apodiformes		
Chimney Swift.....		x
Ruby-throated Hummingbird.....	x	
Coraciiformes		
Belted Kingfisher.....	x	
Piciformes		
Red-bellied Woodpecker.....		x
Downy Woodpecker.....	x	
Northern Flicker.....	x	
Piliated Woodpecker.....		x
Passeriformes		
Tyrannidae		
Eastern Wood-Pewee.....		x
Eastern Phoebe.....	x	
Eastern Kingbird.....		x
Hirundinidae		
Purple Martin.....		x
Northern Rough-winged Swallow..	x	
Barn Swallow.....	x	
Corvidae		
Blue Jay.....	x	
American Crow.....		x
Paridae		
Carolina Chickadee.....	x	
Tufted Titmouse.....	x	
Sittidae		
White-breasted Nuthatch.....		x
Troglodytidae		
Carolina Wren.....	x	
Mniotiltidae		
Sylviidae		
Blue-gray Gnatcatcher.....	x	
Turdidae		
Eastern Bluebird.....	x	
American Robin.....	x	
Mimidae		
Gray Catbird.....	x	
Brown Thrasher.....		x
Sturnidae		
European Starling.....	x	
Vireonidae		
White-eyed Vireo.....		x
Red-eyed Vireo.....	x	
Emberizidae		
Parulinae		
Blue-winged Warbler.....		x
Yellow Warbler.....	x	
Common Yellowthroat.....	x	
Yellow-breasted Chat.....	x	
Cardinalinae		
Northern Cardinal.....	x	
Indigo Bunting.....	x	
Emberizinae		
Rufous-sided Towhee.....	x	
Chipping Sparrow.....		x
Field Sparrow.....	x	
Song Sparrow.....	x	
Icterinae		
Red-winged Blackbird.....	x	
Eastern Meadowlark.....	x	
Common Grackle.....	x	
Brown-headed Cowbird.....	x	
Orchard Oriole.....		x
Northern Oriole.....		x
Fringillidae		
American Goldfinch.....	x	
Passeridae		
House Sparrow.....	x	
Totals	35	17

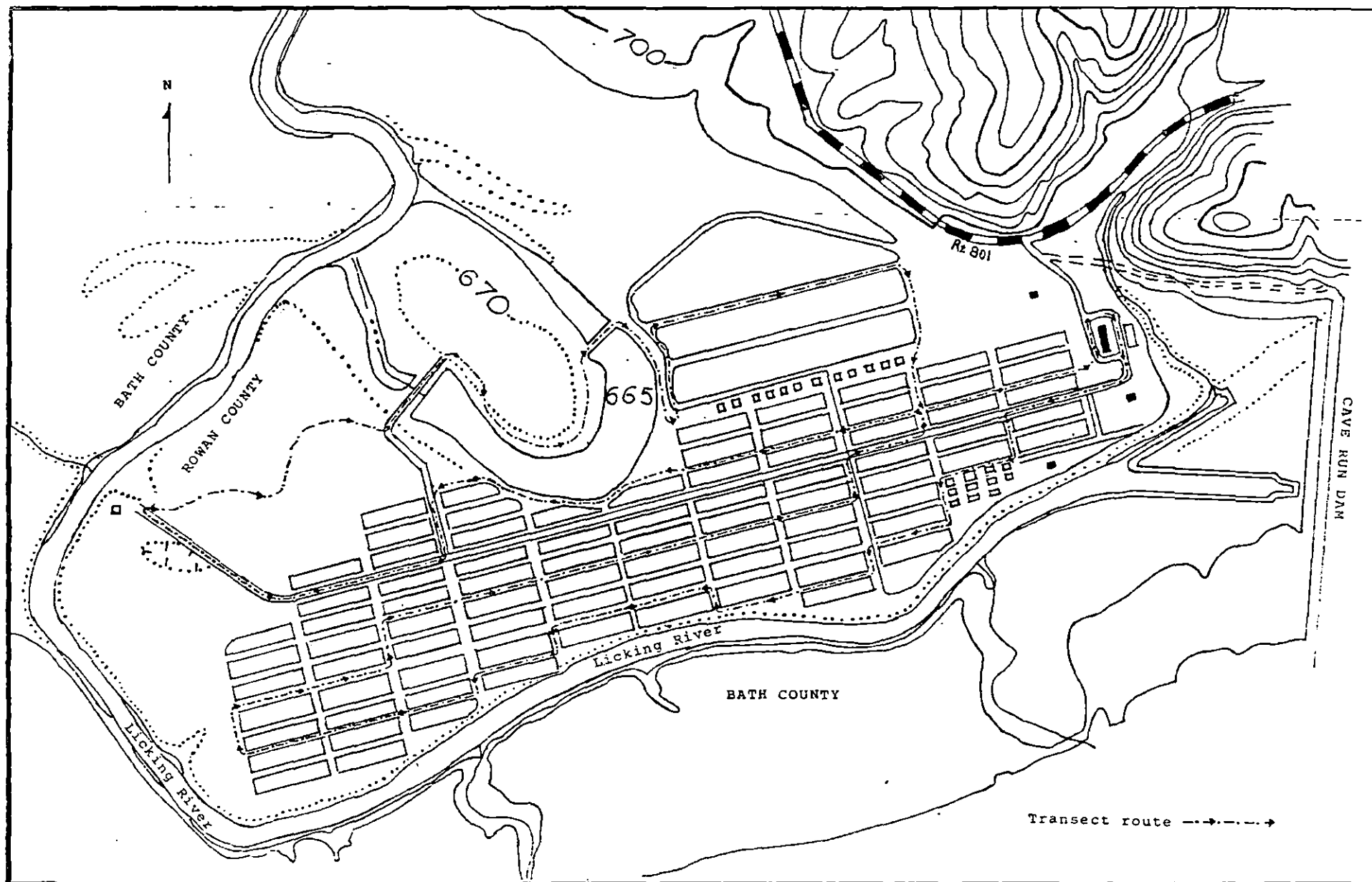


Figure 1. Transect route at Minor E. Clark Fish Hatchery.